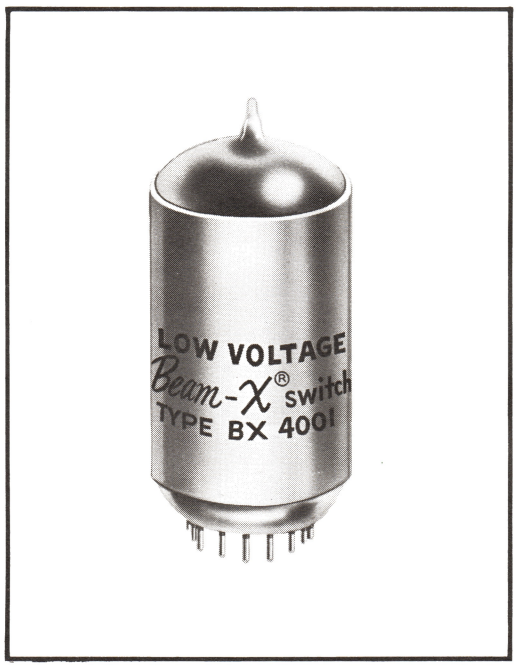
BULLETIN NO. 1019
August 1, 1962

# BEAM-X® SWITCH




## LOW VOLTAGE, SHIELDED
### Type BX-4001

The BEAM-X Switch, type BX-4001 is a 10-position, high vacuum electronic switching device. It is specifically designed and tested for use in low voltage, multiposition electronic switching circuits. It has frequency capabilities from DC to 2 MC and its low voltage characteristics are compatible with standard transistor driving circuitry. In addition, it features magnetically shielded construction for applications where space conservation is important.

## ELECTRICAL CHARACTERISTICS:

| RATINGS ABSOLUTE MAX. | VALUE | NOTES |
|---|---|---|
| Target Voltage ($E_t$) | 300 Vdc | |
| Spade Voltage ($E_s$) | 100 Vdc | |
| Grid Voltage ($E_{cc}$) | 200 Vdc | |
| Shield Grid Voltage ($E_{sg}$) | 200 Vdc | |
| Heater — Cathode Voltage ($E_{hk}$) | ±100 Vdc | |
| Cathode Current ($I_k$) | 10 ma | |
| Individual Target Dissipation ($P/_{ta}$) | 1 W | |
| Heater Voltage ($E_f$) | 6.3 ±10% V | |
| Switching Speed (F) | 2 MC | Note 1 |

## TEST CONDITIONS AND TEST LIMITS

The BEAM-X Switch, Type BX-4001 is tested in a circuit similar to Figure 7. These tests are designed to demonstrate current uniformity from position to position within specified limits and operating stability throughout the frequency range at high and low voltage limits.

| TEST CONDITIONS | VALUE | NOTES |
|---|---|---|
| Spade Resistance ($R_s$) | 270 K ohm | |
| Target Load Resistance ($R_t$) | 10 K ohm | |
| Target Voltage ($E_t$) | Equals $E_s$ | |
| Shield Grid Voltage ($E_{sg}$) | Equals $E_s$ | |
| Grid Bias Voltage ($E_{cc}$) | 26 V | |
| Grid Switching Voltage ($E_i$) | —24 V | Note 3 |
| Heater Voltage ($E_f$) | 6.3 V | |
| Test Frequency (f) | Push Button and 10 Kc | Notes 1, 3 |

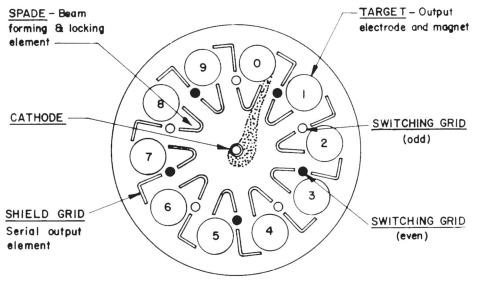
| TEST LIMITS | | |
|---|---|---|
| Spade Voltage ($E_s$) | 30 ±10% V | |
| Individual Target Current ($I_t$) | 1.000 ±30% ma | Note 2 |
| Heater Current ($I_h$) | 150 ±10% ma | Note 4 |
| Firing Voltage ($E_{co}$) | 40 V | Note 6 |

## MECHANICAL CHARACTERISTICS:

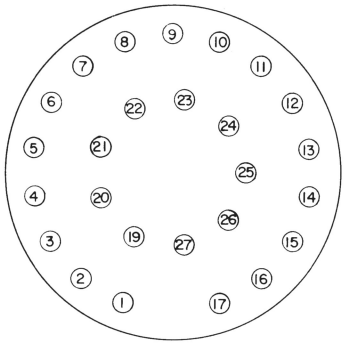
| | VALUE | NOTES |
|---|---|---|
| Overall Length | 3.125 in. max. | |
| Seated Height | 2.875 in. max. | |
| Diameter | 1.270 in. max. | |
| Weight Total | 2.75 oz. | |
| Mounting Position | Any | Note 5 |
| Outline | See Figure 6 | |
| Envelope Connection | See Figure 3 | |

## NOTES

1. The tube is tested at pushbutton and 10 KC rates but will operate at rates exceeding 2 MC under suitable operating conditions.
2. When tube is operated in test circuit at Spade Voltage = 30 V.
3. For higher frequency operation, a greater pulse amplitude is required.
4. When filament is operated at 6.3 V.
5. Tubes may be mounted side by side (no minimum spacing). To avoid possible operational changes in tube characteristics, tubes should not be mounted on a ferrous chassis.
6. Firing Voltage (DC Cutoff Voltage) is that voltage between cathode and spade buss above which erratic electron beam formation will occur. Refer to Bulletin BX-535B for detailed explanation.


SPADE – Beam forming & locking element
TARGET – Output electrode and magnet
CATHODE
SWITCHING GRID (odd)
SHIELD GRID Serial output element
SWITCHING GRID (even)

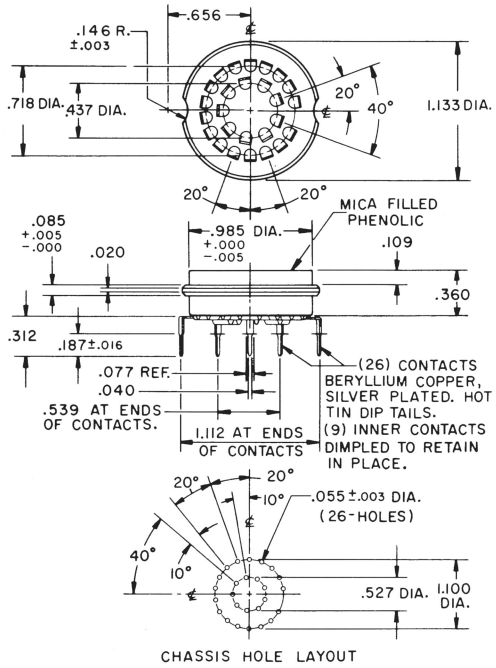
1. CROSS SECTION



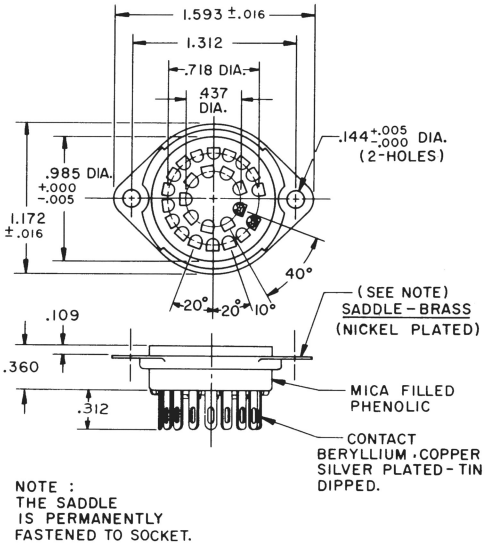
2. PIN NUMBERING DIAGRAM

| PIN NO. | CONNECTION | PIN NO. | CONNECTION |
|---|---|---|---|
| 1 | Spade-0 | 14 | Spade-2 |
| 2 | Target-9 | 15 | Target-1 |
| 3 | Target-8 | 16 | Grid Even |
| 4 | Grid Odd | 17 | Target-0 |
| 5 | Target-7 | 19 | Spade-9 |
| 6 | Spade-7 | 20 | Spade-8 |
| 7 | Target-6 | 21 | Heater |
| 8 | Target-5 | 22 | Spade-6 |
| 9 | Spade-5 | 23 | Spade-4 |
| 10 | Target-4 | 24 | Spade-3 |
| 11 | Shield Grid | 25 | Heater |
| 12 | Target-3 | 26 | Spade-1 |
| 13 | Target-2 | 27 | Cathode |

3. TUBE CONNECTION TABLE

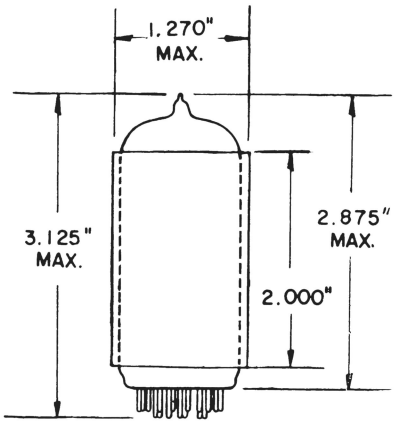



4. PRINTED CIRCUIT SOCKET, SK-131

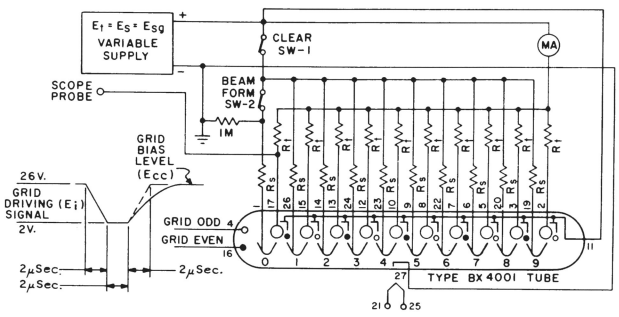



NOTE :
THE SADDLE
IS PERMANENTLY
FASTENED TO SOCKET.

5. GENERAL PURPOSE, SK-100




6. OUTLINE DRAWING




7. TYPICAL TEST CIRCUIT

NOTE: Grid driving signal is applied to grids in push-pull fashion.

ANOTHER ELECTRONIC CONTRIBUTION BY

**Burroughs Corporation**

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